

The following listing of claims will replace all prior versions, and listings, of claims in this application:

Listing of Claims:

Claim 1 (Amended): A method for revascularization, said method comprising the steps of:

- a) choosing a first location on a blood vessel that has a lumen containing blood having a pO_2 of at least 50; and
- b) forming a passageway that extends outside of said lumen and between said first location and a second location on a blood vessel, such that said blood will flow through said passageway, said passageway being formed by i) providing a passageway-forming catheter device that comprises an elongate flexible catheter body having a tissue-penetrating element passable therefrom; ii) inserting said catheter body into the ~~vasculature~~ blood vessel lumen and positioning said catheter body within the blood vessel lumen such that the tissue-penetrating element is located adjacent the location at which said passageway is to be formed; and iii) passing said tissue-penetrating element from said catheter body so as to form said passageway such that blood will flow from the first location through the passageway and to the second location.

Claim 2 (Amended): The method of Claim 1 wherein said first location and said second location are located in the coronary vasculature ~~in the heart~~.

Claim 3 (Original): The method of Claim 1 wherein said first location and said second location are on the same blood vessel.

Claim 4 (Original): The method of Claim 1 wherein said first location and said second location are on different blood vessels.

Claim 5 (Previously amended): The method of Claim 4 wherein said blood vessels are an artery and a vein.

Claim 6 (Original): The method of Claim 4 wherein said blood vessels are a vein and a vein.

Claim 7 (Original): The method of Claim 4 wherein said blood vessels are an artery and an artery.

Claim 8 (Previously Amended): The method of Claim 1 wherein step b comprises forming a plurality of said passageways.

Claim 9 (Previously Amended): The method of Claim 1 wherein step a comprises choosing a location upstream of an obstructed, injured or diseased segment of a blood vessel, and wherein said second location is downstream of the obstructed, injured or diseased segment, such that the blood bypasses the segment.

Claim 10 (Original): The method of Claim 1 wherein said first location is on an artery and said second location is on a vein, such that blood will flow from said artery, through said extravascular passageway, and into said vein.

Claim 11 (Previously Amended): The method of Claim 10 further comprising a step c) of causing the blood which has entered the vein through said extravascular passageway to flow in a retrograde direction through said vein so as to retroperfuse tissue through the venous vasculature.

Claim 12 (Previously Amended): The method of Claim 11 wherein step c comprises blocking said vein at a location adjacent said extravascular passageway.

Claim 13 (Original): The method of Claim 1 wherein the extravascular passageway formed in step b is a primary extravascular passageway formed between a first blood vessel and a second blood vessel such that said blood will flow from the first blood vessel, through said extravascular passageway, and into the second blood vessel.

Claim 14 (Previously Amended): The method of Claim 13 wherein said method further comprises the step of:

- c) forming at least one secondary passageway between said second blood vessel and another

blood vessel of the heart such that blood which has entered the second blood vessel through the first passageway will subsequently flow into another blood vessel through said secondary passageway.

Claim 15 (Amended): The method of Claim 14 wherein said blood is caused to flow into the other blood vessel through the secondary passageway by:

d) blocking the second blood vessel at a location adjacent the second passageway to cause said blood to flow from said second blood vessel through said second passageway and back into said other blood vessel.

Claim 16 (Previously Amended): The method of Claim 1 wherein at least one of said first and second locations is on a blood vessel which is part of a system of blood vessels wherein an obstructed, injured or diseased segment of a blood vessel is present, and wherein step b comprises forming the passageway so as to deliver the blood to a region that has been deprived of blood because of the obstructed, injured, or diseased segment.

Claim 17 (Cancelled) The method of Claim 1 wherein step a of said method is carried out by:

i) providing a passageway-forming catheter device comprising an elongate flexible catheter body having a tissue-penetrating element passable therefrom so as to penetrate through the wall of a blood vessel in which said catheter body is inserted;

ii) inserting said catheter body into the vasculature and positioning said catheter body such that the tissue-penetrating element is located adjacent the location at which said extravascular passageway is to be formed;

iii) passing said tissue-penetrating element from said catheter body so as to form said extravascular passageway in accordance with step a of said method.

Claim 18 (Previously Amended): The method of Claim 1 wherein part of Step b further comprises:

providing and using an orientation means for locating said first and second locations and for orienting the catheter device such that the tissue-penetrating element of the catheter will pass from said first location to said second location, thereby forming said passageway between said first location on a blood vessel and said second location on a blood vessel.

Claim 19 (Amended): The method of Claim 1 wherein the tissue penetrating element of the device provided in part step b further incorporates a lumen through which a guide wire may be passed upon creation of said passageway by said tissue-penetrating element, and wherein said method further comprises the step of:

passing a guide wire through said lumen and allowing said guide wire to remain extended through said passageway following extraction and removal of said catheter, to thereby provide for subsequent advancement of one or more other apparatus through said passageway, over said guide wire.

Claim 20 (Previously withdrawn) A method coronary revascularization in a mammalian heart having arteries and veins formed therein, said method comprising the steps of:

providing a passageway-forming catheter adapted to form an extravascular passageway between two blood vessels;

inserting said catheter into a peripheral blood vessel and advancing said catheter into a blood vessel of the heart;

utilizing said catheter to form at least one primary extravascular passageway between the blood vessel of the heart in which said catheter is positioned and another blood vessel of the heart, such that blood will flow from one of the blood vessels, through the extravascular passageway, and into the other blood vessel

Claim 21 (Previously withdrawn) The method of Claim 20 wherein said at least one passageway is formed between an artery of the heart and a vein of the heart such that blood from the artery will flow through at least one of said extravascular passageway(s) into the vein of the heart.

Claim 22. (Previously withdrawn) The method of Claim 21 wherein arterial blood which as flowed from the artery of the heart into the vein of the heart is subsequently caused to flow through the vein so as to retroperfuse cardiac tissues through the cardiac venous vasculature.

Claim 23. (Previously withdrawn) The method of Claim 22 wherein said arterial blood is caused

to flow through the vein so as to retroperfuse cardiac tissue through the cardiac venous vasculature by blocking flow through the vein in an opposite direction, at a location adjacent an extravascular passageway.

Claim 24. (Previously withdrawn) The method of Claim 21 wherein the method further comprises:

utilizing said catheter to form at least one secondary extravascular passageway from said vein of the heart to an artery of the heart such that arterial blood which has entered said vein of the heart will subsequently flow through said at least one secondary extravascular passageway and into an artery of the heart, so as to profuse cardiac tissues through the cardiac arterial vasculature.

Claim 25. (Previously withdrawn) The method of Claim 20 wherein said method is carried out for the purpose of bypassing an obstructed, injured or disease-affected segment of an artery of the heart.

Claim 26. (Previously withdrawn) The method of Claim 25 wherein said revascularization is performed in the heart of a mammal having a Circumflex Artery, a Great Cardiac Vein, an Anterior Interventricular Vein and a Left Anterior Descending Artery for the purpose of bypassing an obstructed, injured or disease-affected segment of the Circumflex Artery, wherein said method further comprises:

- i. forming a primary extravascular passageway between the Left Anterior Descending Artery and the Anterior Interventricular Vein;
- ii. forming a secondary extravascular passageway between the Great Cardiac Vein and the Circumflex Artery at a location downstream of the obstructed, injured or disease-affected segment thereof; and,
- iii. causing blood to flow from the Left Anterior Descending Artery through the

primary extravascular passageway, through the Anterior Interventricular Vein into the Great Cardiac Vein, and through the secondary extravascular passageway into the Circumflex Artery, downstream of the obstructed, injured or disease-affected segment thereof.

Claim 27. (Previously withdrawn) The method of Claim 26 wherein step iii is accomplished by blocking the lumen of the Anterior Interventricular Vein at a location adjacent the primary extravascular passageway.

Claim 28. (Previously withdrawn) The method of Claim 27 wherein step iii is further accomplished by blocking the lumen of the Great Cardiac Vein at a location adjacent the secondary extravascular passageway.

Claim 29. (Previously withdrawn) The method of Claim 25 wherein said revascularization is performed in the heart of a mammal having a Circumflex Artery, a Great Cardiac Vein, an Anterior Interventricular Vein, and a Left Anterior Descending Artery for the purpose of bypassing an obstructed, injured or disease-affected segment of the Left Anterior Descending Artery, wherein said method further comprises:

- i. forming a primary extravascular passageway between the Circumflex Artery and the Great Cardiac Vein;
- ii. forming a secondary extravascular passageway between the Anterior Interventricular Vein and the Left Anterior Descending Artery at a location downstream of the obstructed, injured or diseased-affected segment thereof; and,
- iii. causing blood to flow from the Circumflex Artery, through the primary extravascular passageway, through the Great Cardiac Vein into the Anterior Interventricular Vein, and through the secondary extravascular passageway into the Left Anterior Descending Artery downstream of the obstructed, injured or disease-affected

segment thereof.

Claim 30. (Previously withdrawn) The method of Claim 29 wherein step iii is accomplished by blocking the lumen of the Great Cardiac Vein at a location adjacent the primary extravascular passageway.

Claim 31. (Previously withdrawn) The method of Claim 30 wherein step iii is further accomplished by blocking the lumen of the Anterior Interventricular Vein at a location adjacent the secondary extravascular passageway.

Claim 32. (Previously withdrawn) A method for performing a medical procedure at an intracorporeal target location within a mammalian body/said method comprising the steps of:

- a) positioning, within a blood vessel a catheter device which comprises:
 - i) a flexible catheter body having a proximal end and a distal end;
 - ii) a tissue-penetrating element passable out of a first location on said catheter body to form an extravascular passageway which extends from the blood vessel in which the catheter is positioned to an intracorporeal target location outside of said blood vessel;
- b) orienting the first location of the catheter body relative to the intracorporeal target location such that the tissue-penetrating element may pass out of the first location of the catheter body to form an extravascular passageway between said blood vessel and said intracorporeal target location;
- c) passing the tissue-penetrating element out of the catheter body to form said extravascular passageway between said blood vessel and said intracorporeal target location; and,
- d) passing at least one procedure-performing apparatus through said extravascular passageway and utilizing said procedure-performing apparatus to perform said medical

procedure' at said intracorporeal target location.

Claim 33. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the delivery of a flowable substance, and wherein said procedure-performing apparatus comprises a tubular cannula through which said flowable substance may be passed into said extravascular location.

Claim 34. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of an implantable drug delivery apparatus, and wherein said procedure-performing apparatus is an implantation device for passing said drug delivery apparatus through said extravascular passageway and for implanting said delivery apparatus at said extravascular location.

Claim 35. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of radioactive matter for radiotherapy, and wherein said procedure-performing apparatus is an implantation apparatus operative to pass said radioactive matter through said extravascular passageway and to implant said radioactive matter at said extravascular location.

Claim 36. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of a stimulator apparatus and wherein said procedure-performing apparatus comprises an implantation apparatus for passing said stimulator apparatus through said extravascular passageway and for implanting said stimulator apparatus at said, extravascular location.

Claim 37. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of a sensor apparatus and wherein said procedure-performing apparatus comprises an implantation apparatus for passing said sensor apparatus through said extravascular

passageway and for implanting said sensor apparatus at said extravascular location.

Claim 38. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of a electrode apparatus and wherein said procedure-performing apparatus comprises an implantation apparatus for passing said electrode apparatus through said extravascular passageway and for implanting said electrode apparatus at said extravascular location.

Claim 39. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of a transmitter apparatus and wherein said procedure-performing apparatus comprises an implantation apparatus for passing said transmitter apparatus through said extravascular passageway and for implanting said transmitter apparatus at said extravascular location.

Claim 40. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of a receiver apparatus and wherein said procedure-performing apparatus comprises an implantation apparatus for passing said receiver apparatus through said extravascular passageway and for implanting said receiver apparatus at said extravascular location.

Claim 41. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of a transponder apparatus and wherein said procedure-performing apparatus comprises an implantation apparatus for passing said transponder apparatus through said extravascular passageway and for implanting said transponder apparatus at said extravascular location.

Claim 42. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is

the implantation of a support member apparatus and wherein said procedure-performing apparatus comprises an implantation apparatus for passing said support member apparatus through said extravascular passageway and for implanting said support member apparatus at said extravascular location.

Claim 43. The method of Claim 32 wherein said support member is a stent which is initially deployed in a compact configuration as it is passed through the extravascular passageway, and which is subsequently deployed to an operative configuration to impart structural support to at least one anatomical structure located at said extravascular location.

Claim 44. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is the implantation of a marker apparatus and wherein said procedure-performing apparatus comprises an implantation apparatus for passing said marker apparatus through said extravascular passageway and for implanting said marker apparatus at said extravascular location.

Claim 45. (Previously withdrawn) The method of Claim 44 wherein said marker is formed of radiographically visible material.

Claim 46. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is tissue ablation, and wherein said procedure-performing apparatus is a tissue ablating apparatus.

Claim 47. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is tissue destruction, and wherein said procedure-performing apparatus is a tissue destruction apparatus.

Claim 48. (Previously withdrawn) The method of Claim 32 wherein said medical procedure is

tissue cutting, and wherein said procedure-performing apparatus is a tissue cutting apparatus.

Claim 49. (Previously withdrawn) The method of Claim 48 wherein the medical procedure is transection of a nerve, and wherein said procedure-performing apparatus is a nerve-transecting apparatus.

Claim 50. (Previously withdrawn) The method of Claim 32 wherein the medical procedure is the sampling of a biological fluid, and wherein said procedure-performing apparatus is a cannula through which a sample of biological fluid may be aspirated from said extravascular location.

Claim 51. (Previously withdrawn) The method of Claim 32 wherein the medical procedure is a sampling of solid matter, and wherein said procedure-performing apparatus is an apparatus for removing a sample of solid matter from said extravascular location.

Claim 52. (Previously withdrawn) The method of Claim 51 wherein said medical procedure is a tissue biopsy, and wherein said procedure-performing apparatus is a biopsy tool operative to sever and retrieve a segment of tissue from said extravascular location.

Claim 53. (Previously withdrawn) The method of Claim 32 wherein said method further comprises:

withdrawing said catheter from the vasculature following performance of said medical procedure.

Claim 54. (Previously withdrawn) The method of Claim 32 further comprising:
positioning a tubular cannula within said extravascular passageway and causing said tubular cannula to remain indwelling within said extravascular passageway following extraction and

removal of said catheter.

Claim 55. (Previously withdrawn) The method of Claim 54 wherein said indwelling tubular cannula extends from said extravascular location to an intracorporeal location, so as to drain fluid from said extravascular location to said second location.

Claim 56. (Previously withdrawn) The method of Claim 54 wherein said indwelling tubular cannula is accessible from any extracorporeal location to permit desired matter to be delivered through said cannula to said extravascular location.

Claim 57. (Previously withdrawn) The method of Claim 56 wherein said cannula extends through said extravascular passageway, and through the vasculature, and is coupled to a subcutaneous injection port which is accessible from an extracorporeal location, to allow flowable matter to be percutaneously injected into said injection port and delivered to said extravascular location through said indwelling cannula.

Claim 58. (Previously withdrawn) The method of Claim 53 wherein said method further comprises:
closing the opening in the blood vessel from which said extravascular passageway was formed, following completion of said medical procedure.

Claim 59. (Previously withdrawn) The method of Claim 58 wherein the closing of said opening in the blood vessel is carried out by the deployment of a blood vessel wall closing apparatus selected from the group of apparatus consisting of:

- an energy-emitting device;
- a cautery device;
- a suturing device;

a stapling device;
an endovascular graft;
a stented endovascular graft;
a balloon;
a coil;
strands of coagulation producing materials;
microfibrillar collagen;
collagen sponge;
cellulose gel; and,
combinations thereof.